Procoagulant Activity of Tracheal and Hypopharyngeal Aspirates and the Diagnosis of Respiratory Distress Syndrome in Newborns.

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It is to the interest of the clinically working neonatologist to find out whether a premature infant attended by him runs the risk to fall sick with a hyaline membrane syndrome.

The procedures described up to now -e.g. the determination of the LS-ratio in hypopharynx or tracheal aspirate- are protracted and the result is too late to produce possible therapeutic consequences.

Most of the surface active phospholipides such as phosphatidylglycerol, phosphatidylcholine, phosphatidylinositol and phosphatidylserin are at the same time able to influence on clotting processes.- It was the purpose of our study to find out whether the coagulant activity correlates with the surfactant properties of the tracheal or hypopharynx aspirates. It should be investigated the efficiency of a simple clotting test to be conducted within a short period of time.

Patients: We examined the hypopharynx secretion of 30 premature infants. The secretion had been collected immediately after birth. Birth weight ranged between 880 and 2300 g, gestation age was between 27 th and 35 th week.

In accordance with the clinical course, 3 groups had been formed. 1. Children the respiration of which continued to be without pathological findings. 2. Children which developed a slight or moderately severe RDS; they got an increased FiO_2 in the incubator or were in need of "continuous positive airway pressure". 3. Children with a severe RDS where intermittent positive pressure ventilation was necessary.

In case of 15 patients from group 3 who needed respirator therapy for 5 days running, tracheal secretion was collected. The required FiO_2 and the maximum positive pressure respiration had been recorded.

Methods: Hypopharyngeal aspirates had been collected by clearing airway after birth. - Tracheal secretions were aspirated in newborns who needed IPPV during therapeutic

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suctioning. With intubated patients, an appointed quantity of Bromthalein had been added. The portion of tracheal secretions could be determined by dilution.

In order to determine PCA, a 5o-fold dilution by physiological salt solution was effected of hypopharynx and tracheal aspirate.

1. The assay was a modification of the recalcification time. o,1 ml of a pooled platelet poor plasma and o,1 ml of sodium chloride (o,9 g/l) had been incubated at 37° C for a period of 2 minutes, mixed and incubated for another 2 minutes. o,1ml calcium chloride (o,o2 mol/l) was then added. The time for clot formation was recorded in seconds by means of a coagulometer described by Schnittger and Gross. - In the test, sodium chloride was replaced by o,1 ml of diluted hypopharyngeal or tracheal aspirate. Procoagulant activity was the shortening of the recalcification time of plasma when hypopharyngeal or tracheal aspirate was added, expressed as a percentage of the baseline control plasma.

2. Second assay: the lecithin concentration in the hypopharyngeal aspirates had been determined. At this, the enzymatic UV-test according to Diedrich et.al. had been applied. Precilip, produced by Messrs. Boehringer Mannheim, served as control value.

Results: In the patient group which did not fall ill with RDS, the mean PCA was 67,7 %. In the patient group which showed a slight or moderately severe symptomatology -they needed increased FiO_2 in the incubator or COAP-therapy- the mean value was lower, 58,8%. In the group of the patients who fell ill with a severe RDS, the PCA-values in the hypopharynx aspirate had been considerably lower, the mean values had been 19,9%. The Wilcoxon test showed a highly significant difference compared to the 2 other groups. ($p \leqq o,o1$)

The lecithin contained in the hypopharynx aspirate which had been determined in comparison showed similar results the correlation of which was, however, not so good. With the healthy patients, lecithin had been determined with 5,7 mg/dl on an average. With the ill groups, the mean values of lecithin had been 3,93 mg/dl in case of slight or moderately severe illness. The variation of lecithin values is, however, considerably greater.

In case of severe RDS, it seems that beyond the 1. day of life only little prognostic importance can be attached to PCA. Independently of the course, PCA seems to rise to mean values of about 8o%.

Conclusion: The procoagulant activity is a simple rapid test which can easily be applied.

If the test is done in hypopharynx aspirate collected immediately after birth, considerable prognostic importance must be attached to it with regard to the severity of a membrane syndrome which is to be expected.

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